OCTOBER 14, 1950
Vol. 13 No. 8

AMERICAN FERTILIZER & ALLIED CHEMICALS

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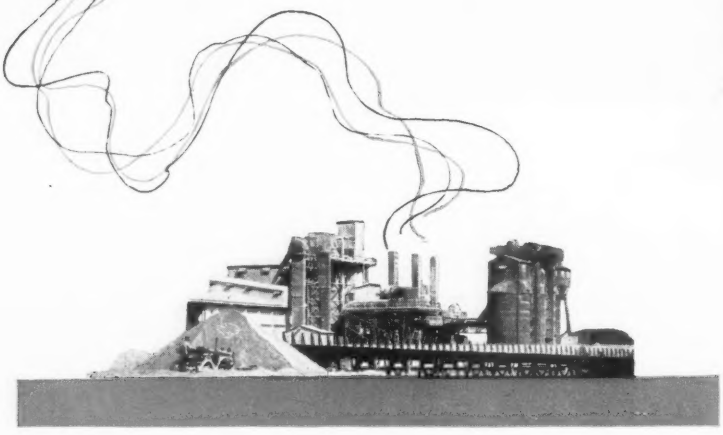

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Cover Story . . .

This is the second time Illinois County Agent Herald K. Rippey and farmer Merle Scholer have appeared together on our cover. This time, Rippey, at left, is shown at his much-practiced calling as friend and advisor to progressive farmers in his area. The photographer spotted Rippey discussing corn yields with Farmer Scholer and if past performance is a guide, our guess is the Scholer's corn crop next year will be bigger, better, and more profitable.

Science *vs.* Industry?

AN EVER widening rift between the policies of the fertilizer industry in the United States and those recommended by the soil scientists was seen by Dr. F. L. Wynd, plant physiologist at Michigan State College, when he spoke before a Canadian fertilizer convention last June. Taking issue with Dr. Wynd, before the annual conference of New Jersey manufacturers and dealers at Rutgers University, September 28, John C. Crissey of the G. L. F Soil Building Service, Ithaca, N. Y., thought it "unfortunate that no one from industry got on his hind legs to take issue with Dr. Wynd. Maybe," Crissey reflected, "(*industry*) thought the statements so ridiculous that they didn't rate an argument."

In any case the record of cooperation between the manufacturers of fertilizers and related farm chemicals and the soil scientists leads *American Fertilizer & Allied Chemicals* to believe that what Dr. Wynd sees as a rift is only a healthy respect for the enormous "don't knows" in agricultural science, coupled with the need for sound economic practices.

Meetings and conferences between scientists and members of industry such as that held annually at Rutgers are themselves articulate evidence that the fertilizer industry is most anxious to hear what the scientists have to say, and, in the past, much of the moneyfor fundamental research has come from industry.

Moreover, many concerns today employ large numbers of scientists on their own staffs who in turn work closely, through their professional associations and journals, with scientists in the academic fields. The idea that industry does not follow the recommendations of these men is no less than incredible. Science, like the automobile, is here to stay.

Before manufacturers can put into practice the ideas now under development in the laboratories, however, a lot more work has to be done. Dr. Firman Bear, head of the Soils Department at Rutgers, points out that before industry can produce fertilizers that overcome soil deficiencies they need to know, first, in what ways the soil is actually deficient. Then, they need to know how to supply the proper elements in available forms. Lastly, they need to know not only what elements are needed but how much of each is required by the particular plants under cultivation.

These problems are nearer to solution now than at any time in the past, and when solved, fertilizer manufacturers will have to be ready to incorporate the new knowledge into their production schedules. No doubt many of the new steps that will eventually have to be taken will cause a lot of headaches in the fertilizer plant; but the industry is under obligation to itself and the nation to do all it can to improve the soil and must find ways to overcome the problems created by progress. Thus, as more and more forward-looking steps are taken, the demand for close coordination between science and industry creates an adhesive force, binding them to the land they both serve—with nary a rift in sight.

Minor Elements Now A Major Problem

and recent meeting at Rutgers University between manufacturers and soil scientists indicates the direction in which new facts may lead industry

By A. M. Brodine

That secondary elements are of primary importance to the maintenance of soil fertility is the view of soil scientists working at the New Jersey Agricultural Experiment Station in New Brunswick. If recommendations growing out of their work are followed, manufacturers may soon be mixing many of the minor elements in with the standard ingredients of the fertilizer bag; insecticides may be included to meet a growing demand on the part of farm operators; and weeds may someday be grown on a wholesale basis to obtain the minor elements many of them accumulate in large quantities.

But even if none of these comes to pass immediately, other important changes in commercial fertilizers are certain. Some of these are hooked up with the general outlook and attitudes of the fertilizer industry. A case in point arises out of remarks made by Jack Crissey of the G.L.F. Soil Building Service, Ithaca, N. Y., when he addressed the recent annual meeting of fertilizer manufacturers and dealers at the New Jersey Agricultural College, Rutgers University. Said Mr. Crissey: "Manufacturers must follow the recommendations of the soil scientists and the ratios marketed must be prepared on a regional basis to take care of the variations in soils and crop requirements."

To this, Dr. Firman Bear, head of the Soils Department at Rutgers, later added: ". . . the fertilizer industry should interest itself in the activity now going on to get more minor elements back into the soil and stop looking at organic farming with a jaundiced eye."

Effects of minor element deficiencies in peach trees can be seen in this experiment conducted by Rutgers horticulturist, Norman F. Childers

Fertility Decreasing

Still other changes in store for the fertilizer industry are arising out of agricultural needs that did not exist a few decades ago. "Virus diseases are with us," stated Charles H. Nissley, extension vegetable crops specialist at Rutgers. "Thirty years ago we didn't know much about them," he said. Speaking on the general subject of "Thirty Years With Vegetables," Nissley went on to say that "now that manure is out as a standard fertilizer, the fertilizer manufacturer must supply the proper material to do the job adequately.

Nissley was one of several speakers at the New Jersey meeting who emphasized that today, more than ever before, contour farming, soil conservation, and adequate fertilizing are needed to keep the productivity of the land at a high level. In spite of the great strides that have been taken in raising the fertility of the soil by those methods, it is becoming increasingly apparent that the fecundity of the soil is gradually degenerating.

Soil scientists are now reporting

New Jersey manufacturers at annual meeting with soil scientists

tests on which they have been working for the last several years which show an increasing number of chemicals—present in soils in amounts once thought negligible—to be of paramount importance in growing healthy crops. Boron, of course, has been added to fertilizers for some time and cobalt has been used on occasion, but now the list of significant trace elements includes zinc, manganese, magnesium, and molybedenum, and the list is growing.

More Research Needed

By no means is the lack of minor elements in the soil the fault of fertilizer manufacturers. Rather, according to Dr. Vincent Sauchelli, director of agricultural research for the Davison Chemical Corporation, the trouble lies in analytical chemistry along with our inability to discover so far the exact minor-element composition of the soil. "We need more information on this," says Sauchelli. This lack of information is one of the factors delaying greater production of fertilizers with minor elements included. To include them, and to meet also the demand for the inclusion of insecticides in the fertilizer bag will create a lot of headaches for the manufacturer, fears Sauchelli.

One of the first steps soil scientists say must be taken is to conduct more research on soil analysis. Already some progress has been made in this direction. Rutgers University, for example, has recently constructed a specially designed room for spectroscopy. As yet, they do not have a spectroscope, but one is in the offing. "We think this is an important thing," said Dr. Bear. He told the New Jersey manufacturers that so far $14,000 had been rasised by contributions from industry for the purchase of the machine and its accessories, the final cost of which would be a little over $20,000.

Private industry itself has been working on the problem of discovering the exact make-up of the soil, and farm machinery manufacturers in at least one instance have attempted to establish an independent laboratory at Columbus, Ohio, for analyzing soil samples for individual farmers. Gratifying through these steps may be, the answer to the question, "Just what, exactly, is in the soil?" will not be the end of the fertilizer producer's problems. The answer may, as Dr. Bear points out, "raise a great many more questions than it answers."

For example, farmers will undoubtedly want to know not only the percentage composition of the soil but how much of each element is required in a given soil for the particular crop under cultivation.

Reproduction in Cattle

Here again, some progress was reported at the Rutgers meeting, Dr. E. R. Purvis, of the Rutgers Soils Department, said that scientists have long known that manganese is definitely tied up with reproduction in cattle. However, experiments to determine the exact nature of the tie-up could not be conducted because forage crops known to be deficient in manganese were not available for experimental purposes. Recently, several yields of such crops have been discovered and purchased. Now, controlled experiments to determine the place of manganese in animal nutrition are under way. Results of these experiments may lead to the wide-spread use of manganese in fertilizers, especially those used for improvement of pastures for dairy cattle.

Already, the New Jersey Experiment Station recommends the inclusion of boron in fertilizers, but Dr. Purvis cautions against what he calls "shot-gun" methods. The big danger in trying to throw everything at the soil it could possibly

(Continued on page 8)

need is that the soil's chemical balance may be seriously disturbed. "Don't add minor elements," says Purvis, "unless you know you're deficient." Fertilizers, as now pictured by Dr. Purvis, are substances which replace chemicals leached from the soil. This can be interpreted as a strong reason for following the advice of Dr. John R. Taylor of the American Plant Food Council, by marketing fertilizers on a regional basis formulated to meet localized conditions.

Fertilizer Holdout

Fertilizer mixes already on the market can be used more efficiently and by areas of the agricultural industry not now generally included in the fertilizer market. One of the largest of these is the dairy industry, long a hold-out in the systematic use of fertilizers. At present great emphasis is being given to the improvement of grasslands, not only as a soil conservation measure, but to provide increased and improved forage for cattle. To date, this large potential market is mostly virgin territory as a market for commercial fertilizers. "Manufacturers must get on the grasslands program bandwagon," declared Mr. Crissey.

At the same time that the fertilizer industry is looking for new answers to old problems through expanded research and is extending its markets for present products, there is a good chance that it has been overlooking a veritable gold mine that is literally in everyone's backyard. In discussing the need for returning more organic material to the soil, Dr. Firman Bear cited the work of J. P. J. Van Buren, South African author of a recent book, "Soil Fertility and Sewage," published by the Dover Press, New York, 1950.

Fertilizer From The City

Van Buren's book is mainly concerned with the utilization of urban wastes for the production of valuable fertilizers. After considerable experimentation with the problem in a South African city, Van Buren concluded that for each 10,000 people in the city there are 250 cu. ft. of dry refuse and 500 gallons of night soil each day. To handle this, he used a trench system with a volume of 10,000 cu. ft. From this he produced 1000 cubic yards of sieved compost at a total cost of about $1 per cubic yard. Of course, all the work was done by hand and at a very low labor cost.

Dr. Bear then called attention to a report published by the Refuse Disposal Co., Ltd., Holland, outlining a more modern method of handling the same problem. This company's installation at Wyster, Holland, annually handles 150,000 tons of town waste (mostly from the Hague.)

Modern Method

Trains with refuse run on one of four viaducts that are 20 feet high and 1000 feet long. When a train stops, the bottoms of the cars open automatically and material drops into the viaduct below which is allowed to fill to its full height. Then, with frequent mechanical turning, the refuse is allowed to ferment from 4 to 8 months. Taken to the factory the fermented refuse is unloaded mechanically, screened, magnetically freed of iron, and pulverized in a hammer mill. The final product is free of glass splinters, has an earthy appearance and is practically odorless, the report states. Capacity of the plant is 80 tons per hour and it now operates at that rate.

Analysis High

Analysis of the final product shows that it contains:

Up to 0.5% P_2O_5; 0.5% N; 0.2% K_2O; 3.0% CaO; 0.3% MgO; 0.005% B; and 0.04% Cu. It also has small amounts of all the minor elements now thought to be essential, as well as approximately 9 per cent organic matter, and 30 per cent moisture. The material is also high in mineral matter which, in winter, comes largely from ashes from home fuel.

Applied at the rate of 20 to 40 tons per acre, the material raises the *p*H value of the soil, supplies large amounts of standard fertilizer elements, overcomes deficiencies of boron and magnesium and has marked effect on improving the adsorptive capacity of sandy soil. The cost is said to be less than $1 per ton.

United States Careless

"The United States," says Dr. Bear, "is careless with its topsoil and humus, allowing it to be carried away by wind and water and one must wonder how much longer this practice can be continued with impunity."

"We throw away large amounts of poultry and pig manure, getting rid of it in the most convenient manner at hand. We burn it, bury it, and throw it into the sea. The same applies to city garbage, ashes, and other wastes.

"In examining crop refuse, sods, and cover crops that were incorporated into the soil (*in experiments carried out by the New Jersey Experiment Station*) attention was given to their minor-element content. Comparative analyses were made of rye, rye-grass, vetch, and alfalfa and also of snap beans and carrot wastes from the same soil. Rye was relatively much lower in all minor elements than rye-grass. Vetch was exceptionally high in boron, cobalt, molybdenum, and zinc. Alfalfa and carrot tops were very high in manganese and bean tops were high in boron." The experiments showed that soil must be fed with organic matter in larger amounts than roots and residues of cultivated crops can provide. This requires manure and well-chosen mixtures of sod and cover crops.

Cultivated Weeds

The idea that weeds may someday be cultivated stems from the fact that many of them are known to be active accumulators of some of the minor elements. By raising weeds of certain varieties and then plowing them under, farmers may someday supply their soil with a wide variety of the precious minor elements. As yet, soil scientist and agronomists are not recommending wholesale sowing of weeds, however. More has to be learned about the specific elements accumulated by given weeds and the particular needs of the soil. ♦

An important job in business is

Writing Understandable Letters

Condensed from Credit World

SOME LETTER WRITERS appear to agree with the oft-quoted statement of Samuel Johnson that "words were invented to conceal thought."

Ever since Rudolf Flesch published his book, "The Art of Plain Talk," more and more people have been made aware of the need for them to adopt clear, concise writing habits. Most frequent writing task for most of us is that of writing letters, business or otherwise. But when we write to our friends, wives, or sweethearts, we usually fall into an easy, conversational style of writing. In other words, we simply write the way we think. The result? The letter is perfectly understandable. Not so with many of our business letters.

No fault in letter writing is more short-sighted—or more expensive—than the use of words that the reader will not understand. This practice wastes time and postage; it confuses the reader, and it often irritates him.

Imagine the plight of the Kentucky mountaineer who received this explanation from an insurance company:

Surrender of the policy is permissible only within the days attendant the grace period on compliance with the citation relevant options accruing to the policy. We are estopped from acquiescing to a surrender prior to the policy's anniversary date. We are confident that an investigation relevant to the incorporation of this feature will substantiate that the policy is not at variance with policies of other companies.

Here is the mountaineer's reply:

Dear Mister:

I'm sorry, but I don't understand your letter. If you will explain what you mean, I'll try to do what you want.

Yours truly,

Which writer did the better job of making his thoughts clear to the reader—the high-powered insurance correspondent or the simple mountaineer?

Too many correspondents still have the notion that big words are more impressive than little ones. They go out of their way to dig up long, cumbersome words instead of using simple ones.

Letter writers can profit from the announcement issued by an eastern newspaper editor to his reporters:

"We do not commence, we begin. We do not reside in residences, we live in homes. We do not retire, we go to bed. Our priests, ministers, and rabbis are not divines. Our lawyers are not barristers. Our undertakers are not morticians. Our plumbers are not sanitary engineers. Our cobblers are not shoe rebuilders. Not all fires are conflagrations."

Effective writing—whether in a letter or a newspaper—makes understanding quick and easy for the reader.

Actually, a long word should be used only when it expresses the writer's thought more clearly and precisely than a short one. Other factors being equal, the short, simple word always carries more force. The reader is accustomed to it, and he grasps its meaning at a glance. As L. E. Frailey puts it, big words in business letters are "about as helpful as overshoes in a foot race." They only complicate a message that should be made just as clear and simple as possible.

As a final example, let's review the experience of the plumber who wrote to the National Bureau of Standards. He said he found that hydrochloric acid opens plugged pipes quickly, and asked whether it was a good thing to use. A scientist at the Bureau replied as follows:

The uncertain reactive processes of hydrochloric acid place pipe in jeopardy when alkalinity is involved. The efficacy of this solution is indisputable, but the corrosive residue is incompatible with metallic permanence.

The plumber wrote back, thanking the Bureau for telling him this method was all right. The scientist was disturbed about the misunderstanding, and showed the correspondence to his boss—another scientist—who immediately wrote the plumber:

Hydrochloric acid generates a toxic and noxious residue which will produce submuriate invalidating reactions. Consequently, some alternative procedure is preferable.

The plumber wrote back that he agreed with the Bureau—hydrochloric acid works just fine. Greatly disturbed, the two scientists took their problem to the top boss. The next day the plumber received this telegram:

Don't use hydrochloric acid. It eats hell out of the pipes. ◆

Industrial News Notes

Clifton A. Woodrum

President of the American Plant Food Council, Inc., since it was formed in June, 1945, Clifton A. Woodrum, died suddenly of a coronary thrombosis in Washington at 6:00 a. m. October 6th. He was 63 years of age.

He studied law at Washington and Lee University and began practice in 1908 at Roanoke. In 1917 he was elected Commonwealth's Attorney, serving until 1919 when he was unanimously chosen to occupy the Bench of Hustings Court of the City of Roanoke. In 1922 he resigned to run for Congress against the Democratic incumbent. He served in the 68th Congress through the 78th Congress.

Mr. Woodrum resigned his position as a member of the House of Representatives, Sixth District of Virginia, after serving 23 years in order to accept the presidency of the Council. As a member of Congress, he was widely known as a leader in the field of Government economy and in 1939 in a poll conducted by *Life Magazine*, he was rated by 53 Washington correspondents as one of the 10 most able members of the House of Representatives.

Under his leadership, the American Plant Food Council has shown a steady growth in membership, influence and service to the industry. At industry and agricultual meetings throughout the country, the Judge made valuable contributions to the advancement of science and economics in agriculture.

He is survived by his widow, the former Miss Lena Hancock of Bedford County to whom he was married in 1905. Also surviving are a son Clinfton A., Jr., and a daughter, Martha Anne, all three residing in Roanoke.

Mr. Woodrum was a member of the Green Memorial Methodist Church of Roanoke, a Thirty-third Degree Mason, Past Potentate Kazin Temple, A.A.O.N.M.S. and numerous other fraternal orders.

The funeral services were held at the Green Memorial Methodist Church, Roanoke, Virginia, October 9th with interment at Fairview Cemetery.

Spencer Opens Atlanta Sales Office

Spencer Chemical Company has announced the opening of its new southeastern district sales office in Atlanta, Georgia, through which it will serve a territory consisting of Georgia, Alabama, Florida, South Carolina, and the eastern part of Tennessee with agricultural nitrogen products.

In charge of the office, located at 412 Candler Building, is John L. Sanders, district sales manager, who has been a member of the Spencer sales organization since 1946. For the past three and one-half years he has represented the company in Iowa and was located previously in Louisiana.

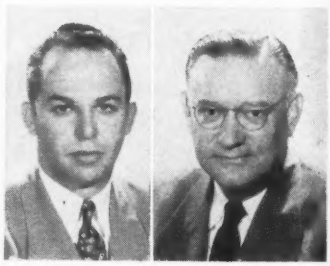
The new Atlanta office also serves as headquarters for Floyd N. Miller, district technical service representative, who is available to customers as a technical consultant.

Sales representatives for the states in the southeastern territory will be under the supervision of the Atlanta office.

Commercial Solvents Personnel Appointments

Maynard C. Wheeler, Vice-President in Charge of Production of Commercial Solvents Corporation, has been elected to the Corporation's Board of Directors, it was announced by Major T. P. Walker, Chairman of the Board.

Mr. Wheeler joined Commercial Solvents in 1923 as a chemical engineer. He became Manager of the Terre Haute plant in 1929, and later, Production Manager for all CSC plants. In 1945 he was made Vice-President in Charge of Production.



Roth **Wheeler**

Dr. Roger W. Roth has joined the Agricultural Division, as entomologist, with headquarters in New York. Dr. Roth will work with Federal and State Experiment Stations and insecticide manufacturers on the new CSC products designed for use in the insecticide, fumigant, and fungicide field.

Prior to joining CSC, Dr. Roth was entomologist for Bell Aircraft Corporation where he made major contributions to the development of spray, dust, and fog equipment for application of insecticides by helicopter. His work covered an unusually wide variety of insect pests and materials used in insect control on major crops throughout the United States and in South America. He is recognized for de-

velopments in aerosol fogging technique for black fly and mosquito control.

A graduate of the New York State College of Forestry at Syracuse with a major in forest entomology, Dr. Roth received his doctorate at Cornell University, majoring in economic entomology. For several years he served on the staff of the Department of Entomology at Cornell, and conducted experimental work on insecticides and fungicides both in the laboratory and in the field.

Dr. Richard S. Egly has been appointed Director of Chemical Research in the Research & Development Department at Terre Haute, Indiana.

Formerly in charge of Chemical Engineering Research, Dr. Egly has supervised important work upon many of the Corporation's products, including nitroparaffins, methylamines, and benzene hexachloride.

NFA'S Public Relations Work Given National Recognition

"For its excellent services to its industry and the public" during 1949–50, The National Fertilizer Association has been singled out for an Award of Merit by the American Trade Association Executives. The award was presented to NFA September 27 in Boston, Massachusetts, at the 31st annual convention of ATAE, composed of 2000 members from all over the United States.

The Jury of Awards, of which Secretary of Commerce Charles Sawyer was chairman, cites the Association "especially for its long-range program of research, education and trade promotion. During the past decade, some 400 pamphlets have been prepared to increase the knowledge of, and proper use of, fertilizers to augment food production. Sound suggestions are included to decrease soil erosion and leaching. The research and education work is also made known to the public through N.F.A. movies, radio programs and all other types of promotional media."

In making their decision, the jury reviewed typical examples of NFA's work, including the book, *Hunger Signs in Crops* published in cooperation with the American Society of Agronomy; pamphlets such as "Your Future's in the Bag" and "A Century of Progress with Fertilizers"; movies like "What's in the Bag" and "New England's Green Pastures"; also, the achievements of the Plant Food Research Committee; the promotion of the Virginia-North Carolina "corn war"; and leadership in the observance of 1950 both as Pasture Year and as the centennial year of the founding of America's fertilizer industry.

Spencer Chemical Promotions

Spencer Chemical Company, Kansas, City, Mo., has announced the election of **John R. Riley, Jr.,** formerly general sales manager, as vice-president in charge of sales, and **John P. Miller,** treasurer, as vice-president and treasurer.

Mr. Riley is a graduate chemical engineer who has been associated with the firm since 1942. He served first in the operating division and then headed up postwar utilization studies. When Spencer went into commercial operation, Mr. Riley took charge of the sales division. Prior to 1942, he was employed by the Shell Petroleum Corporation and Dearborn Chemical Company in various operating and sales capacities.

Mr. Miller, formerly an executive with the accounting firm of Ernst & Ernst, joined Spencer Chemical Company at its inception and has headed its treasury division from the first. He is a graduate of the University of Missouri and a lifelong resident of Kansas City.

The Company has also announced the appointment of **Joe E. Culpepper,** assistant general sales manager, to the post of general sales manager. He succeeds John R. Riley, Jr., who was elected vice-president in charge of sales.

Mr. Culpepper, a graduate of Mississippi State College, joined spencer in 1946 after broad experience in the fertilizer industry with American Cyanamid Company and the Synthetic Nitrogen Products Corporation. Originally director of sales, fertilizer division, he was soon advanced to assistant general sales manager.

Ireland Appointed Barrett Agronomist

The Barrett Division, Allied Chemical & Dye Corporation, New York, has appointed Carrol F. Ireland as district agronomist to cover Virginia, Maryland, Delaware and West Virginia, with headquarters at Barrett's new office in the Travelers Building, Richmond, Va. Mr. Ireland was formerly associated with the Borden Company, Stuart, Fla., where he served as chemist and plant manager.

As district agronomist, he will have charge of the field research, development and promotion of Barrett nitrogen products, both materials for direct application, which includes nitrate of soda, "A-N-L" brand fertilizer compound and other nitrogen fertilizer materials distributed by the company.

Riley Culpepper Miller

Page Named Phillips Export Manager

The appointment of Frank T. Page as manager of the New York export sales office of Phillips Chemical Company's fertilizer sales division has been announced by K. S. Adams, president of Phillips Chemical Company and of its parent

organization, Phillips Petroleum Company, Bartlesville, Okla.

Mr. Page began his business career as sales representative with Quaker State Oil Refining Corporation. Following a war service interruption, he joined Socony-Vacuum Oil Company as sales representative at Peoria, Ill. In 1948 he became associated with Phillips in the crude oil purchase and sales division of the supply and transportation department.

New Company to Run Texas Ammonia Plant

A new company, the San Jacinto Chemical Corporation, has been organized to operate the San Jacinto Ordnance Ammonia Plant. The R. S. Mueller Company, of Baltimore, Md., which leased the plant from the Army, has assigned the lease to new company.

The officers of the San Jacinto Chemical Corporation are E. M. Fleischmann, President; R. S. Mueller, Vice-President; R. F. Hopkins, Vice-President and Treasurer.

The Executive Offices of the company are located in the Tower Building, Baltimore 2, Md.

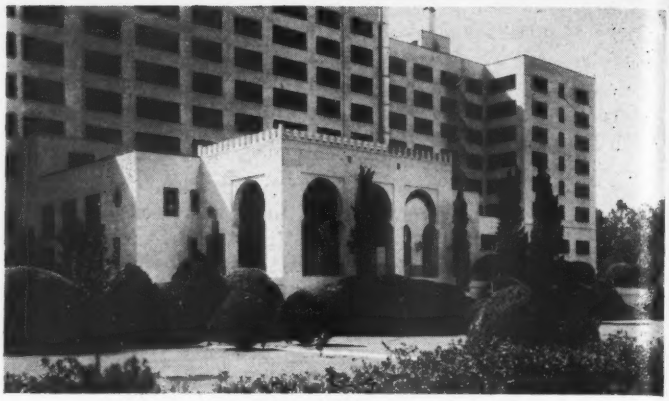
The plant, which has a daily capacity of 70 tons, was originally located at Louisiana, Mo., but was moved to San Jacinto, Texas, in 1949 and was operated by the Hercules Powder Co. until last July.

Operations were resumed in August by the new company and the plant is now running to capacity, with an oprating force of 85 persons. Plans are under way to increase the output in the near future.

Japanese to Install New Urea Plant

Nissin Chemical Company, Osaka, Japan, has signed a contract with Chemical Construction Corporation, New York City, covering engineering designs for a modern urea plant to be located at an existing plant site of the Nissin Company.

The Nissin Company is one of the largest chemical producers in Japan and was formerly known as the Sumitomo Chemical Company, Ltd.



Edgewater Gulf Hotel, Edgewater Park, Miss., where National Fertilizer Association will hold Fall meeting November 13, 14, and 15

Kraft Bag Issues Brochure

Kraft Bag Corporation, manufacturers of heavy-duty, multiwall paper bags, has just issued a colorful brochure entitled "Dependable." It draws a parallel to the sun and the stars for the Company's dependability as a source and as a service, and illustrates the various types of shipping sacks the company makes in its two completely integrated plants—St. Marys, Ga., and Gilman, Vt. Copies of the brochure may be obtained by addressing Harry C. Lawless, Sales Mgr., Kraft Bag Corp., 630 Fifth Ave., New York 20, N. Y.

Planters Cotton Oil Elects Officers

Officers and directors of the Planters Cotton Oil and Fertilizer Company, Rocky Mount, N. C., were elected at the forty-seventh annual meeting of the stockholders held on September 7, 1950.

One new director, Benjamin B. Woodard, was named and a number of promotions among officers were listed.

The president, Robert D. Gorham, declared in his annual report that the mill had enjoyed a satisfactory year. He also discussed the operations of the company and commented on the outlook for the year ahead.

The following directors of the company were elected: Robert D Gorham, W Maurice Daughtridge, DeLeon Carter, Milton P. Dawson, R. Russell Braswell and Benjamin B. Woodard.

After the meeting of the stockholders, the directors elected the following officers of the company: Robert D. Gorham, President; W. Maurice Daughtridge, Vice-President; John D. Robbins, Vice-President; William T. Melvin, Vice-President; George W. Gorham, Jr., Vice-President; Theo. H. Pitt, Secretary and James L. Murphy, Treasurer.

Davison Appointments

New assignments for members of the Operations and Research and Development Divisions of The Davison Chemical Corporation were announced by the company on October 2nd. The appointments were:

Dr. W. L. Judefind to be assistant to Dr. G. M. Hebbard, Vice-President of Operations, stationed in the Baltimore office of the corporation.

T. O. Tongue to be Manager of Process and Quality Control at the Curtis Bay plant.

Dr. P. L. Veltman to be manager of the Research and Development Division at the Curtis Bay plant under Dr. C. E. Waring, Vice-President of Research and Development.

AVAILABLE NOW FOR DIRECT APPLICATION

PHILLIPS 66 AMMONIUM SULFATE!

NITROGEN 21%

Here's a high nitrogen fertilizer that's available now for direct application. It's a quality product, too, with fine physical characteristics. The large crystals of Phillips *66* Ammonium Sulfate resist caking... flow freely... drill efficiently.

Tonnage quantities of Phillips *66* Ammonium Sulfate are ready for shipment in bags or in bulk.

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OMAHA WOW Building	LOS ANGELES 4521 Produce Plaza West	AMARILLO First National Bank Bldg.

AMMONIUM SULFATE • AMMONIUM NITRATE • NITROGEN SOLUTIONS • ANHYDROUS AMMONIA

Our Destiny Is Tied To Soil Conservation

THE FATE of our present civilization is more likely to depend upon what we do about soil conservation in the next few years than upon hydrogen bombs, bacteriological warfare, or invasions from Outer Space by multi-headed little men in magnetically-propelled flying saucers.

A striking example of the part agriculture plays in the destiny of a nation is set forth in the history of China. This nation was once the center of civilization, but today its barren soils stand as a constant reminder of what the loss of fertility and productiveness will do to a nation's well-being. The land of Canaan once "flowed with milk and honey," but today its people eke out their existance on unproductive soil. And so it has been since time began that each nation has prospered only so long as its agriculture prospered. Let us consider America and its future.

When our forefathers first landed on the shores, they stood on virgin soil. Because this soil was rich it produced bounteous crops; our country expanded and prospered, and our people remained free and independent. In the space of less than three hundred years it grew from a tiny settlement into the mightiest nation on earth. If we are to retain this high position of world leadership and prestige our agriculture must prosper. The happiness and welfare of our people and their continued freedom and independence depend upon the productiveness of our soil. Therefore good land management is a necessity. This means the complete utilization of all lands for continued maximum production. To attain this we must control erosion, conserve water, and return to the soil the needed plant foods and minerals.

Controlling erosion is a very effective way of preserving the fertility of the soil. In the beginning nature covered the land with vegetation for protection against wind and rain. Man destroyed this protection when he began cultivating the land. In 1935 the Soil Conservation Service was established to aid farmers in effecting means to control erosion. This can be done by contour plowing and strip cropping, erecting wind breaks, and by keeping in sod land that is too steep for cultivation. By terracing and contour cropping water can be better controlled, lessening the danger of gullying and the washing away of valuable topsoil. Stubble mulching and the leaving of crop residue on the surface also is effective in controlling erosion and water run-off.

Cropping, as well as erosion, depletes the plant food in the soil. Plants like all growing things need food for growth and development. The soil, climate, and crops to be raised determine the kinds of plant food needed. Each individual farmer must find out what nutrients are needed for his farm and crops, and apply them accordingly. It takes about as much time and labor to plant and harvest a poor crop as it does a good one, so, if a farmer is to remain prosperous, his per acre yield must be high.

High yields per acre can be obtained by the use of sufficient quantities of plant foods and fertilizers, which include crop residue, green manure crops, barnyard manure, commercial fertilizers and lime. By plowing under crop residue, green manure crops and barnyard maure, valuable organic matter is restored to the soil. This not only adds fertility but also makes better soil structure or tilth. Commercial fertilizers add nitrogen, phosphates, potash and other minerals. A good farmer does not overlook the fact that crop rotation also adds to the fertility of the soil, especially if the rotation includes a well inoculated legume. The Extension Service, County agents and Soil Conservation Service stand by ready to help each individual farmer with his own specific soil problem.

(*Continued on page 20*)

BONE MEAL TANKAGE BLOOD
SHEEP—COW—POULTRY MANURE
CASTOR POMACE NITROGENOUS
GROUND TOBACCO STEMS HOOF MEAL
ALL FERTILIZER MATERIALS
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FERTILIZER MATERIALS MARKET

NEW YORK

Price Increases Reported in Sulphate of Ammonia, Castor Pomace and Some Organics. More Foreign Materials Coming on the Market

NEW YORK, October 11, 1950

Sulphate of Ammonia

Several producers raised their prices slightly to $37.00 per ton, f.o.b. shipping point, but most producers were still maintaining old price levels as they were sold ahead and had none to offer.

Nitrate of Soda

No change was noted in this material and demand was said to be fair.

Ammonium Nitrate

Some producers are behind slightly on shipments and this material is in a strong position in spite of recent advance in prices. Demand continues excellent.

Nitrogenous Tankage

This material is difficult to buy for nearby shipment in spite of the fact that numerous foreign offerings have been made and sold. The market is now quoted at from $4.15 to $5.50 ($5.04 to $6.68 per unit N), according to the production point. Buyers have not been able to fill their requirements.

Castor Pomace

Producers advanced the price of this material to about $37.50 per ton, f.o.b. production points, with demand still heavy. They have had considerable difficulty in obtaining raw material from abroad.

Organics

Organic fertilizer materials displayed a mixed tone. While some organics were scarce and in demand, the higher priced materials had a tendency to ease. Tankage and blood were nominally quoted at $8.00 per unit of ammonia ($9.72 per unit N), f.o.b. Eastern points, due to lack of trading, but it was thought the material could be obtained at lower prices on a firm bid. Linseed meal was easy for nearby shipment and quoted nominally $57.00 to $60.00 per ton in bulk, f.o.b. shipping points. Soybean meal was also easy with the market quoted at from $51.00 to $54.00 per ton, f.o.b. Decatur, Ill., according to position. Cottonseed meal maintained a firm position due to the expected short cotton crop.

Fish Meal

With the fishing season on the East Coast about at an end, little change in prices was noted although available stocks at some plants were well cleaned up. The market was nominally quoted for menhaden fish meal at $130.00 per ton, f.o.b. fish factory. There were still offerings available of imported fish meal.

Bone Meal

While the demand from the feed trade has slackened somewhat, fertilizer buyers are picking up available offerings as they come on the market. Prices remain about stationary.

Hoof Meal

With last sales at about $7.25 per unit of ammonia ($8.82 per unit N), f.o.b. Chicago and offerings not too plentiful, this material enjoys a firm position.

Superphosphate

Triple superphosphate remains tight for nearby positions and leading producers are sold out. Regular superphosphate is gradually moving into a firmer position because of increased costs that the producers are forced to contend with.

Potash

It was reported that a rather substantial quantity of foreign potash has been sold recently at a price equivalent to the domestic price at Eastern ports. Demand continues very heavy from all sections.

PHILADELPHIA

Farmers Taking Mixed Goods Earlier than Usual. Most Materials in Good Supply

PHILADELPHIA, October 11, 1950

There is better than usual movement of raw materials which is helped by the fact that farmers show an inclination to place their orders for mixed goods earlier than in recent years. There is no severe shortage of basic raw materials, although the supply position of some articles is quite tight.

Sulphate of Ammonia.—While the market is firmer, demand and supply are sufficiently even to prevent accumulation of stocks.

Ammonium Nitrate.—This continues definitely tight and production is well under contract.

Nitrate of Soda.—Demand continues on a satisfactory seasonal basis with supplies ample to meet all requirements.

Blood, Tankage, Bone.—Blood and tankage are rather quiet with the demand not sufficiently strong to maintain recent price levels. Sales have been made at $8.00 to $8.25 per unit of ammonia ($9.72 to $10.02 per unit N). Hoof meal sold at $7.25 per unit of ammonia ($8.82 per unit N)—a little higher than last, but with only slight trading. Bone is rather quiet and quotations remain at $60.00 to $62.00 per ton, depending on the grade.

Castor Pomace.—The only movement is against existing contracts,

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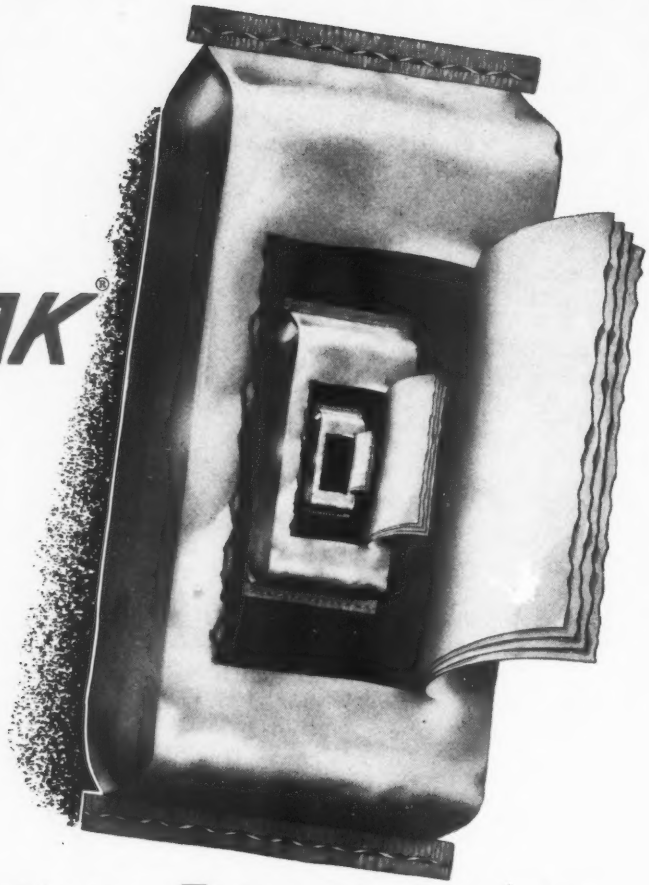

Fertilizer manufacturers account for a large part of the many millions of multiwall paper bags supplied every year by Bagpak. There are good reasons:

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BAGPAK DIVISION

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and short supply precludes any new offerings. Higher prices are expected when the material gets back into supply.

Phosphate Rock.—Market is reported firm with steady movement against standing contracts. There has been a slight price advance due to higher production costs. Export market is rather quiet.

Superphosphate.—This continues to enjoy normal seasonal demand, and while production has been rather backward lately, the total thus far this year is ahead of last. Triple grade continues in quite tight position.

Potash.—Demand is strong and domestic production continues at full capacity. Shipments are principally against contracts with some little inconvenience due to car shortages. Considerable foreign potash is obtainable but not much interest is shown here.

CHARLESTON

Some Tightening of Mineral Nitrogen in Evidence. Box Car Shortage Hampers Material Movement

CHARLESTON, October 9, 1950

Triple superphosphate continues short of demand, and normal superphosphate is tending to tighten. Mineral nitrogen supplies are tightening also. Shortage of box cars continues to hamper movement of fertilizer materials generally.

Organics.—The market on organic fertilizer materials continues tight with the major producers of nitrogenous tankage sold up for many months ahead. Nitrogenous tankage is nominally $4.35 to $4.50 per unit of ammonia ($5.29 to $5.47 per unit N), in bulk, f.o.b. domestic production point. Dried ground blood is around $8.25 to $8.50 per unit of ammonia ($10.02 to $10.33 per unit N). The market is practically bare of offers of imported nitrogenous tankage.

Castor Pomace.—No offers of domestic production are on the market, and movement is strictly against existing contracts. Last sales were at $32.50 per ton in bags, f.o.b. Northeastern production points, but indications are that any new offers will be at higher figures.

Dried Ground Blood.—Market is featureless at around $8.25 to $8.50 ($10.02 to $10.33 per unit N), f.o.b. New York and Chicago. Fertilizer tankage offerings continue light at around $8.00 to $8.25 per unit of ammonia ($9.72 to $10.02 per unit N), in bulk, f.o.b. Chicago.

Potash.—The market situation is firm with demand strong. Production continues at capacity, and movement is steady to consumers hampered somewhat by spasmodic car shortage. Nothing new on imported potash has been noted.

Ground Cotton Bur Ash.—Producers continue in a well sold position on the expected supplies for the new season, particularly in view of the considerable reduction of supplies that are estimated will be available.

Phosphate Rock.—The market is firm and movement steady against contract. No change in prices has been noticed.

Superphosphate.—This market is quite firm and in some areas prices for bulk normal superphosphate have advanced. Production is being curtailed in certain areas due to shortage of sulphuric acid. Triple superphosphate is extremely tight, and demand is heavy.

Sulphate of Ammonia.—Movement of coke-oven material is steady and even with production, preventing accumulation of stocks. This market is quite firm with a tendency for prices to advance.

Ammonium Nitrate.—Both Canadian and domestic is in heavy demand well in excess of supplies. One domestic producer, at least, is reported unable to accept further orders beyond present commitments

Nitrate of Soda.—Stocks continue adequate to meet the demand, and no unusual activity is noted. Prices remain unchanged.

CHICAGO

Heavy Vegetable Meal Production Affects Price Levels of By-Product Organics. Further Declines Possible

CHICAGO, October 9, 1950

In this area the market on animal ammoniates during the past two weeks registered a slight decline as indicated in previous issue. At this writing there is very little action and with soybean meal in heavy production from new crop beans it is very doubtful that any improvement will take place in the immediate future.

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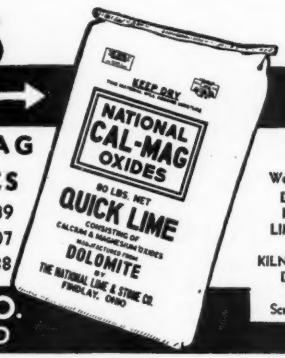

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Bucket Elevators
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As a matter of fact, unless buying interest in proteins becomes more aggressive, it is quite possible that values will decline still further.

Ground and sacked meat scraps, 50 per cent protein, were recently reduced $5.00 per ton to $110.00 and digester tankage, 66 per cent protein, to $117.00 per ton. In outlying territories, meat scraps are offered as low as $102.00 per ton sacked and digester tankage at $115.00 per ton. Dry rendered tankage ranges in value from $1.70 to $1.80 per unit of protein, depending upon location. Wet rendered tankage is quoted $8.50 to $8.75 per unit of ammonia $10.33 to $10.63 per unit N), delivered and dried blood $8.25 to $8.50 ($10.02 to $10.33 per unit N), delivered. Steamed bone meal, 65 per cent B.P.L. in bags is listed at $75.00 to $80.00 per ton and raw bone meal, 4½ per cent—45 per cent at $70.00 per ton.

Order Pesticides Early

Farmers and growers are being urged to survey their 1951 requirements for insecticides, fungicides and related materials by L. S. Hitchner, executive secretary of the National Agricultural Chemicals Association, and to place their orders for these materials immediately.

Mr. Hitchner emphasized that since many of the raw materials required by the agricultural chemicals industry are also necessary for defense, growers should make their needs known as soon as possible, so that industry will be better able to schedule plant operations. Because of expected or existing shortages of many raw materials, including chlorine, benzene, copper and lead, Mr. Hitchner added, growers should be prepared to use alternate products in some instances.

Beaumont Birch Elevator Equipment

A new catalog No. 10-B has been issued by Beaumont Birch Company, Philadelphia, to illustrate Beaumont Beaucalloy chains, "Uni-Cast" buckets and "Trac-Pull" traction wheels. Made of special steel alloy, these Beaucalloy products give exceptionally long service in handling all types of bulk materials—sticky, abrasive, or hot. It is claimed that maintenance costs have been cut in half through use of this equipment. Copies may be obtained from Beaumont Birch Company, 1505 Race St., Philadelphia 2, Pa.

Chemical Dude

A chemical dude looks as though it will be a help when it's roundup time in Texas and other beef producing states.

The chemical, a mean hombre with mesquite, is 2, 4, 5-trichlorophenoxyacetic acid, commonly called 2, 4, 5-T. The first commercial application, which is expected to eliminate the spiny shrub, was recently made on an initial 1600 acres of the Williams brothers' Pitchfork Ranch near here. It was sprayed by airplane.

Mesquite has long been considered a nuisance by ranchers for three reasons: it conceals cattle and makes them man-shy, makes it difficult to drive them and deprives grass of moisture and nutrients. Cowboys, who have had to ride through its thorny thickets on periodic roundups, will be glad to see it go.

The Pitchfork application, which will be followed by others shortly, was the result of a three-year field study under the direction of C. E. Fisher, of the Texas A. & M. Experiment Station here. Monsanto Chemical Company of St. Louis, a major producer of 2, 4, 5-T, was one of those supplying experimental quantities of the chemical.

Nitrogen Fertilizer for Irrigated Corn

Sixty pounds of nitrogen (applied as a side dressing of ammonium nitrate about March 15) raised corn yields about 30 bushels per acre above the average of about 46 bushels on untreated plots, at four locations in eastern Oklahoma in 1949. On a fifth area, where the corn followed alfalfa, there was no increase from applying nitrogen. All plots were irrigated.

E. RAUH & SONS FERTILIZER CO
FERTILIZER MANUFACTURING PLANT
PLYMOUTH, INDIANA
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Soil Conservation

(Continued from page 14)

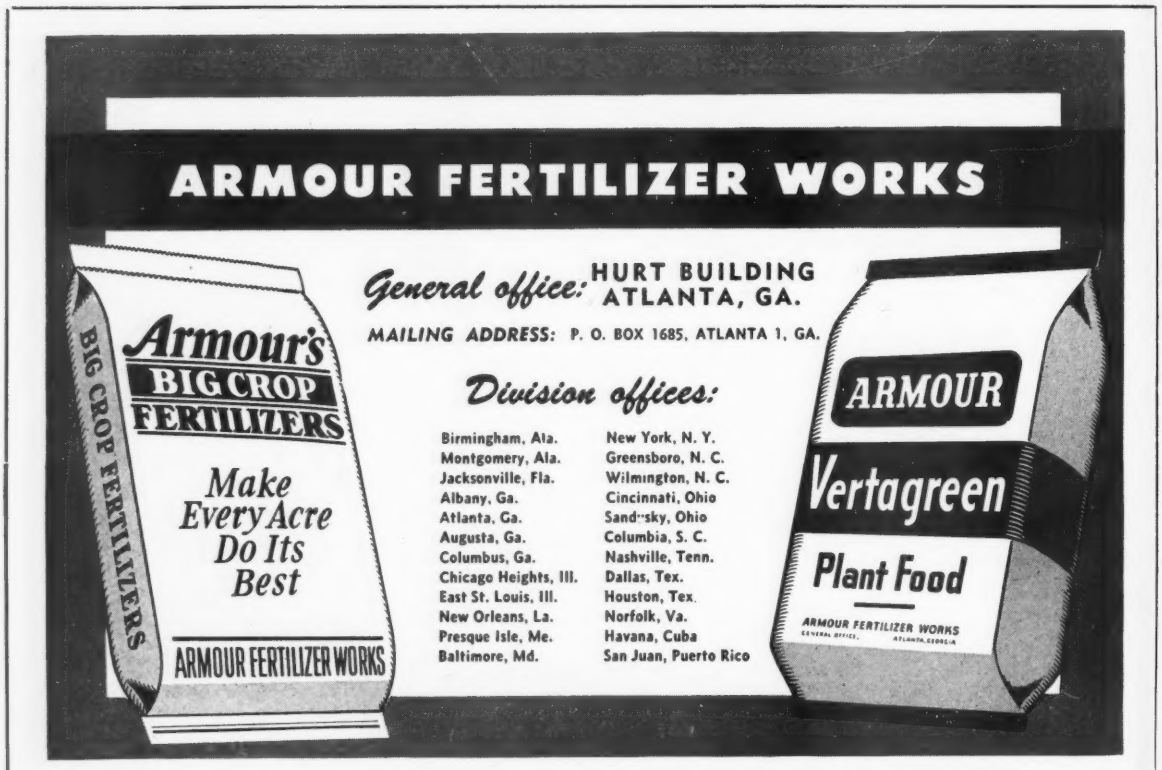
This idea of a prosperous agriculture is not entirely new, but it is more important today than ever before. Our population is constantly increasing, and we are faced with the problem of feeding this expanding population on the same number of acres as formerly. Also many millions elsewhere will continue to look to America for food and fiber. With good land management our soil will produce abundantly for the health and happiness of our own people, and we will still be able to share our produce with others. If we conserve and use wisely our oldest and most valuable resource—our land—we can assure for ourselves and our posterity a continued high standard of living, freedom and independence.

THE NORMAL geologic erosion that has gone on for ages under natural conditions is a part of the whole complex soil-making process. But when man steps in and cultivates the land he creates conditions that may result in an enormous acceleration of erosion. Under certain conditions this accelerated erosion is the most dramatic and disastrous of the evil things that can happen to the soil.

It is of two familiar types, water erosion and wind erosion. Water erosion occurs chiefly on sloping land removing the soil in sheets or cutting it with many small streamlets or gashing out deep gullies. The steepness of the slope, the soil type the intensity of the rainfall, and the land use all affect the character and rapidity of this process. Wind erosion occurs on both sloping and level land and it too is affected by soil type. One factor is common to both kinds of accelerated erosion; they both depend upon removal of the natural vegetative cover which includes its complex underground roots and its residue of organic matter on and in the soil. For example, some experiments show that a cover of dense vegetation is 300 times more effective in retaining rainfall than clean tilled crops on the same kind of land. Moreover, the rate of erosion increases as the upper layers of soil are successively removed.

Among soil deficiencies that affect productiveness, those of organic matter, nitrogen, phosphorous, and potassium are of special importance.

In general, the fertility of virgin soils is associated with the continuous supply of organic matter they receive from native vegetation, which is in balance with other factors. The mere act of cultivation tends to reduce the supply in many soils. Since agricultural crops are generally removed instead of being left to decay, not enough raw material is added to the soil each year to maintain the natural balance. This rapid reduction of soil fertility may occur even without erosion but it is true that most cases speed up erosion. One result is a serious loss of notrogen which is largely stored in organic matter and released by decay. Nitrogen is a fundamental element in the building of protein, the staff of life. Thus we can see if we only give nature a chance the productivity of our soils will be maintained and our nation's future secured. ◆



FARM PORTRAIT NO. 10

It was the rich harvest—not ghosts—that Halloween originally celebrated!

And today, on the great majority of our farms, the Halloween pumpkin shines out over fields that have already been harvested. The richer this harvest has been, the more likely it is that, before another season, these fields should be renewed and fortified in their fertility by the wise use of fertilizers.

Many of the most effective of these fertilizers contain potash—often Sunshine State Potash, a product of New Mexico. For potash is not only a soil nutrient, it is a crop strengthener as well, helping to resist disease and drought. Through its considered use, any farmer may be assured of increased crop output, and superior condition at time of harvest.

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COTTON COUNCIL PUSHES USE OF COTTON BAGS

Cotton fertilizer bags constructed from quality sheeting with high re-use value are gaining swift approval in an initial appearance on the market this season, according to a report of the National Cotton Council.

Pointing to the sheeting bag as an important new "plus value" for farmers, the Council cites significant advantages in savings through household re-use and resistance to breakage.

MR. AND MRS. FARMER
We Have an EXTRA BONUS For You!
THE "New Look" IN
COTTON FERTILIZER BAGS
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"NEW LOOK" COTTON FERTILIZER BAGS ARE AVAILABLE IN PRACTICAL TOWELING, STURDY DENIMS AND SHEETINGS
THESE NEW COTTON FERTILIZER BAGS HAVE ALL THE EXTRA QUALITIES OF GOOD COTTON BAGS
1 Greater Strength
2 Less Breakage, Reduced Waste
3 Increased Market For Your Cotton
4 Easy Conversion To Other Uses
Plus
STILL GREATER REUSE VALUES
SEE THEM NOW and Place Your Order for Fertilizer
IN COTTON BAGS

Campaign Poster

According to a survey of 1500 families in 14 southern states conducted recently by the *Progressive Farmer*, re-use appeal of the sheeting bag will be a strong factor in buying. Ninety-four per cent of those replying to the questionnaire expressed a preference for cotton fertilizer bags because of re-use values.

To back the introduction of the sheeting bag the National Cotton Council has launched a series of promotion measures carrying the "plus value" message to farmers.

Ads at least a quarter page in size are appearing in fall issues of Farm Bureau papers in heavy fertilizer consuming states. A four-page folder in two colors summarizing advantages of cotton fertilizer bags is being offered dealers for distribution to individual customers.

Large two-color posters announcing availability of the "new look" bags are being offered to manufacturers for distribution to dealers.

Copies of the folder, poster, and advertisement re-prints may be obtained free of charge by writing the National Cotton Council, P. O. Box 76, Memphis 1, Tennessee.

In addition to re-use and durability values, the promotion literature points up significance of the fertilizer bag market to farm economy. Continued success of the sheeting bag can mean an additional $25,000,000 annually in farm income, the Council states.

Summers Items

James C. Totman, Assistant Manager of Summers' Bangor, Maine office, was elected a Representative to the Maine Legislature in the recent State Election. He is also a member for a three-year term of the Bangor City Council.

Arthur F. C. Van Den Bergh, Director General of the Diamond Fertilizer & Chemical Co., Ltd., of London, England, accompanied by Mrs. Van Den Bergh, arrived in New York on September 23 on the *Mauretania*. They expect to remain in this country visiting friends in Baltimore and New York until October 11.

Mr. Van Den Bergh was elected a Director of the Summers Fertilizer Company, Inc. at its annual meeting on September 28.

Working Soils Too Much?

If you are one of many fertilizer salesmen who has observed the soil on some of your customer's farms draining more slowly than it used to, you'll be interested in some observations made by Ray Cook of the Michigan State College soil science department. He believes this slow draining is one conclusive bit of evidence that we are overworking our soils.

Experiments have been run at the Michigan agricultural experiment station to determine how crops will grow on land where the soil has been worked less than usual before seeding crops.

In one experiment oats were planted with a drill mounted on a plow packer which was hooked directly behind the plow. Thus seeding was done in the same operation with the plowing. Yields ran slightly higher than they did when oats were planted in the usual way.

Yields of sugar beets, beans, and corns have been just as high when the only tillage was accomplished by means of light implements which trailed behind the plow, as when the land was disked and harrowed in the conventional manner. In fact in 1949 the yield of beets from plots fitted with a mulcher following the plow was 15 tons as com-

(*Continued on page 24*)

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All-Steel Self-Contained Fertilizer Mixing Units
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Bemis Band-Label Burlap Bags . . . the bags with the wide, white paper print band . . . are here! They have been thoroughly tested! And in every case, the report all along the line is . . .

They're the best! Packing crews, handlers, management, dealers, and customers make it a landslide vote for Bemis Band-Label Burlap Bags.

Here's Why:

- ☆ Your brand identification stands out much better in the bright, colorful inks on the white paper band.
- ☆ Ink on Bemis Band-Label printing does not rub off.
- ☆ Your brand is removed with the Band-Label and thus will not be used if the bag is refilled by someone else.
- ☆ With the Band-Label removed, the bag has a higher salvage value.

Get the full story about Bemis Band-Label Burlap Bags from your Bemis man.

Bemis also makes regular cotton and Bemilin (dress print) bags, multiwall paper bags, and Bemis Special Thread and Mainstay Twine for bag closing—all of them *superior products.*

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New Orleans • New York City • Norfolk • Oklahoma City • Omaha • Phoenix • Pittsburgh • St. Louis
Salina • Salt Lake City • San Francisco • Seattle • Wichita

Overworked Soils

(Continued from page 22)

pared to 13 tons on plots fitted conventionally.

Weed growth has been less on the plots where "once over" methods were used because the weeds were covered well and not pulled back up again with the harrow.

In the light of such experiments, Cook recommends that farmers give more thought to the possibility of improving the physical condition of their soils by less working and by producing more soil building grasses and legumes.

English Joke:

Amateur gardener with magnesium deficiency in his land enters local chemist's shop: "Seven pounds of Epsom salts—veterinary grade—please." Elderly lady standing by sees him receive the package, and anxiously whispers: "I do hope it will put you right."

Organic Matter Requires Nitrogen

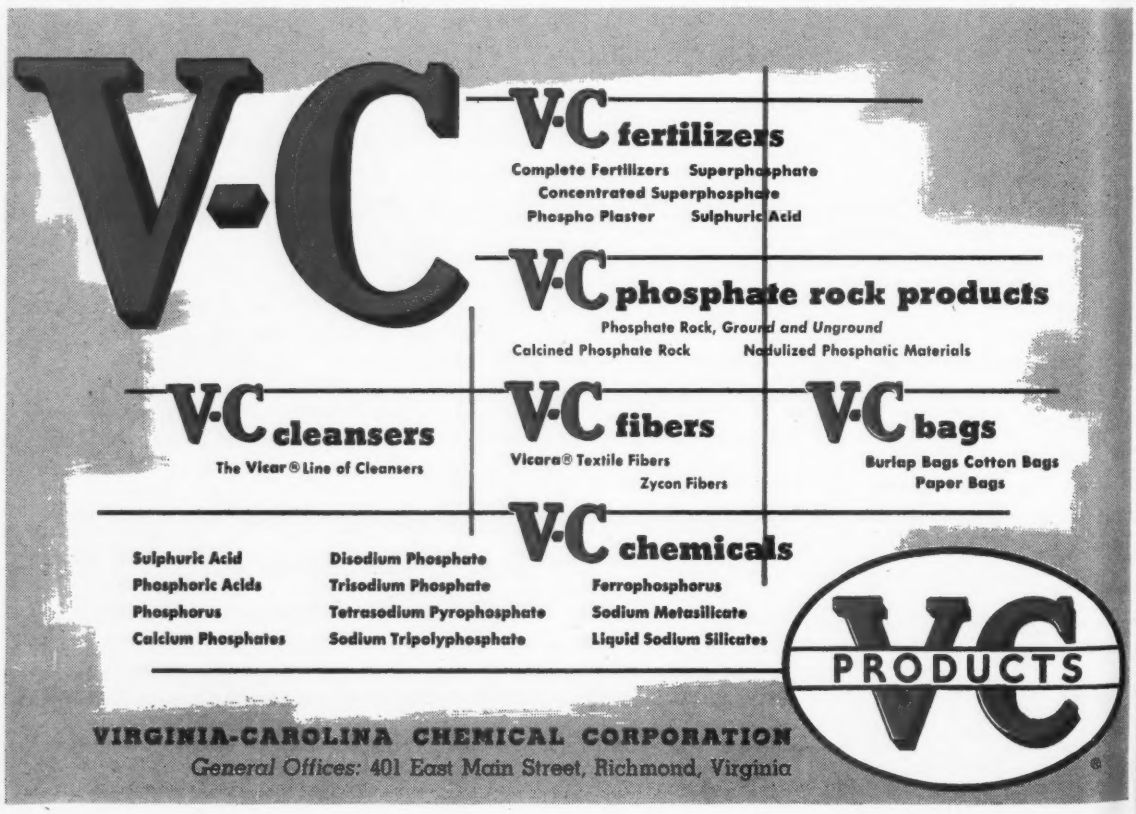
In agricultural circles from the farmer to the "expert" we hear these questions argued. How important is organic matter? How can organic matter be maintained? How can organic matter be increased?

Ching-Kwei Lee and Dr. Roger Bray of the Illinois Agricultural Experiment Station recently reported results of nitrogen and organic matter studies under the major systems of crop rotation and fertilizer practices that are now being used in Illinois.

Ching-Kwei Lee and Dr. Bray conclude, "Without extra nitrogen in the rotations studied, there appears to be no hope of maintaining or increasing soil organic matter. When sufficient is learned about mineral nitrogen use and planting rates for average seasonal condition, addition of extra mineral nitrogen to the corn crop may provide the additional nitrogen needed for maintenance and at the same time pay its cost through increased corn yields. How far one can go in selling off crop residues (straw and stover) and still maintain or build up soil organic matter and maintain yields is not known, although the answer appears to depend on use of fertilizer nitrogen and maintenance of all the other nutrients, especially phosphorus and sulphur, removed in the residues. This study indicates that, because of insufficient nitrogen in the system, the immense amounts of organic matter returned are having no more than a short-time effect."

Sweet Clover Rotation Boosts Protein in Wheat Pasture

Sweet clover in rotation with wheat has more than doubled the protein production of the wheat pasture, as a 7-year average at the Perkins Farm. Continuous wheat averaged 58 pounds of protein per acre in forage harvested about March 20 each year. The first year after sweet clover it was 138 pounds, second year 130 pounds, and third year, 100 pounds. Both plots received superphosphate.



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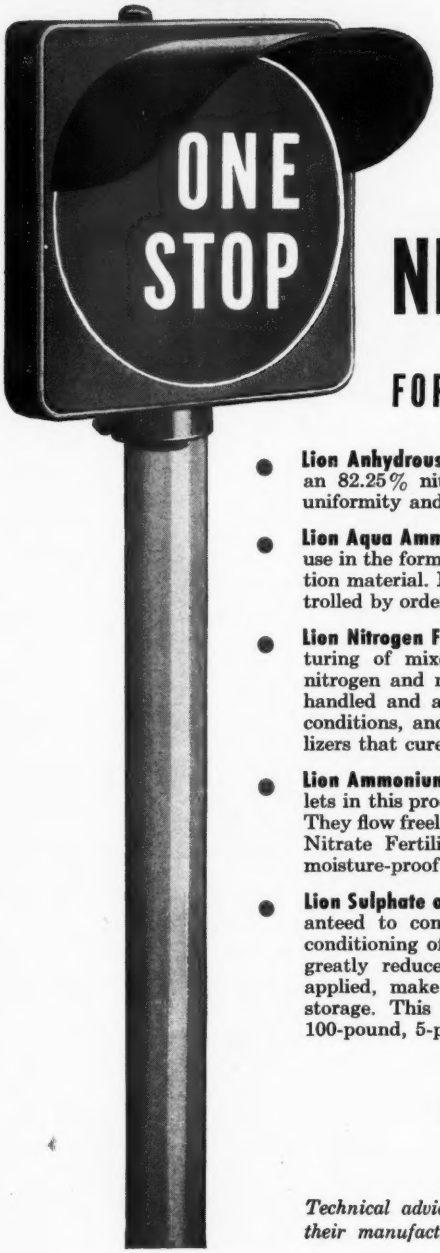

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- **Lion Aqua Ammonia** . . . This product is available to manufacturers for use in the formulation of mixed fertilizers or for sale as direct application material. Normally about 30% ammonia, its content can be controlled by order to suit your needs.
- **Lion Nitrogen Fertilizer Solutions** . . . Made specifically for the manufacturing of mixed fertilizers, these products supply both ammonia nitrogen and nitrate nitrogen in the ratios desired. They are easily handled and available in three types designed for varying weather conditions, and for formula requirements in the production of fertilizers that cure rapidly, store well and drill evenly.
- **Lion Ammonium Nitrate Fertilizer** . . . The improved spherical white pellets in this product contain a guaranteed minimum of 33.5% nitrogen. They flow freely, resist caking and store much better. Lion Ammonium Nitrate Fertilizer is shipped in 100-pound, 6-ply bags with two moisture-proof asphalt layers.
- **Lion Sulphate of Ammonia** . . . This new, superior-type sulphate is guaranteed to contain a minimum of 21% nitrogen. Through special conditioning of the larger crystals, moisture and free acid content is greatly reduced. These factors, together with the special coating applied, make for greater resistance to caking in shipment or in storage. This product flows freely. It is shipped in bulk and in 100-pound, 5-ply bags laminated with asphalt.

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How to spot . . .

Soil Deficiencies In Corn

Two kinds of firing are showing up in Iowa corn, observes H. B. Cheney, Iowa State College extension agronomist.

He says when corn fires first along midribs of the lower leaves, with the rest of the plant turning lighter green in color, it indicates a nitrogen deficiency.

This type of firing is showing up most on eroded hillsides and on light-colored soils that are low in organic matter. Few legumes in the rotation, failure to return manure to the land and growing corn for several years on the same land may lead to nitrogen deficiencies in most soils, Cheney explains. The nitrogen deficiency will show up most about tasseling or silking time.

If It's Potash

Where lower leaves are turning yellow or fired on the outside edges with the centers of leaves remaining green, a potash deficiency is present, the agronomist said. This type of firing is most common in the high lime areas in north central Iowa or on the slowly drained or sandy soils of northeast or southeast Iowa.

Cheney emphasizes that a water shortage will show up in corn plants in the form of rolling leaves and wilt and in severe cases, tops of the plants will turn white. In contrast, actual firing of lower leaves may be traced to soil deficiencies.

Plan Soil Program

He adds that it's too late to correct deficiencies to benefit this year's corn, but now is a good time to start planning an improved soil management program that will take care of future crops.

Where nitrogen deficiencies show up, attention can be given to using more legume-grass sod and adding manure or nitrogen fertilizer. Determining and supplying lime, phosphate and potash needs of the soil also are important.

Cheney advises farmers to take soil samples according to instructions available at county extension directors' offices and send samples in for testing. Those sent in during the next few weeks will avoid the seasonal rush and test results will be mailed back early enough to permit lime and fertilizer plans to be made in time to take care of the 1951 crop.

If the soil does not already have the necessary nitrogen stored in it, a low per acre yield will be harvested from small yellowed stalks, he says. Such corn will not stand a drougth.

To insure a good corn yield, he suggests the use of 200 pounds of ammonium nitrate or 300 pounds of sulphate of ammonia applied as a side dressing. He says these amounts will balance out the fertilizers that were added to the soil in the beginning of the crop year.

He says the crop will stay green longer; will stand up better if the weather turns dry and that the corn harvested will be high in quality.

Fertilization in Arkansas

An extra 32 bushels of oats per acre gave plenty of proof this year that Edgar Johnson's soil fertility program is paying off big.

From ten acres on his north Sebastian county Arkansas farm he harvested 540 bushels of oats this summer. A neighbor, using the same oat variety, threshed only 860 bushels from approximately four times that acreage.

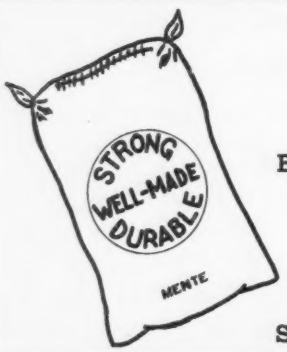
Correct fertilization, plus winter cover crops, spelled out the big difference, Assistant County Agent Arnold A. Berner pointed out.

Before planting the oats, Mr. Johnson had previously turned under a green manure crop of vetch. And he fertilized with 400 pounds of 5-10-5 per acre at seeding time.

In February he top-dressed the oats with 75 pounds of ammonium nitrate per acre.

His neighbor's 40-acre field received no fertilizer, and hadn't grown a single green manure crop in 12 years.

Next year Mr. Johnson will seek even higher yields by using 600 pounds of fertilizer instead of 400, he told the assistant agent.



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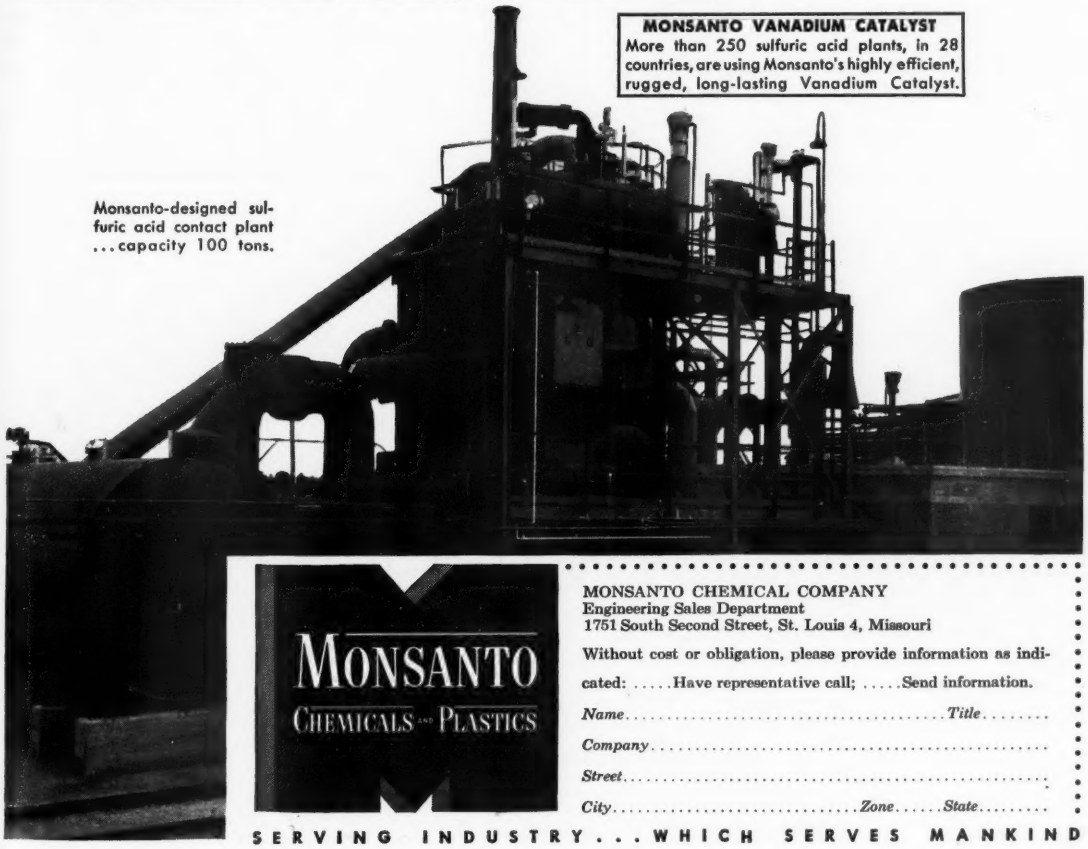

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A Side Dressing May Be Needed

Farmers who applied from 200 to 300 pounds of 4–12–4 or 5–10–5 fertilizer per acre on their corn land have supplied enough phosphoric acid to produce about 60 bushels of corn but only enough nitrogen to produce 15 bushels, says M. K. Thornton, extension agricultural chemist of Texas A. & M. College.

He adds if the soil was already rich in nitrogen and potash, a big per acre yield of corn can be expected if weather conditions during the growing period are favorable. Growing a properly fertilized and inoculated legume crop in a regular crop rotation system is one of the best methods for adding much of the extra nitrogen that will be needed by the following crop, says Thornton. The legumes, when they are turned under, not only add plant food to the soil but also organic matter. This in turn improves the tilth of the soil and increases its water holding capacity.

"You Can't Get Blood Out of A Stone" Applies to Pastures

A well-managed dairy farm must have an abundance of high-quality pasture available continuously from early spring until late fall. Every good dairyman knows that the cheapest milk is produced on pasture. Based upon studies by the Delaware Agricultural Experiment Station, Dr. C. E. Phillips, Head of the Agronomy Department, recently stated, "A good pasture is worth at least $2.00 per week per cow when compared to barn feeding."

He further stated, however, that, "Good pastures are not often produced by accident or wishful thinking. They are the result of careful planning, correct fertilization and intelligent management."

Each quart of milk removes plant food from the soil. To emphasize the importance of adequate fertilization, Dr. Phillips says, "An average cow will eat the equivalent of two tons of dried grass during the growing season. That much feed removes from the soil the amount of plant food contained in 550 pounds of sulphate of ammonia, 230 pounds of 20 per cent superphosphate, 185 pounds of 50 per cent muriate of potash, and 50 pounds of hydrated lime." Many soils fix much of the applied phosphorus. Assuming one acre of pasture per cow, this plant food removal could be met in a practical way with an annual application of 1,000 pounds of 10-10-10 per acre. Some of the plant food is returned in the manure, so some of the more successful dairymen with plenty of good pasture have figured about right when they apply 500 to 800 pounds of 10-10-10 per acre per year.

Legume Pasture Returns over 300 Pounds Beef an Acre

Beef cattle gained 316 pounds an acre on bromegrass-lespedeza-Ladino-alfalfa pasture at Lathrop, according to a test supervised by Marion Brown and Joe Baldridge at the University of Missouri College of Agriculture. Emphasis was given in this test to a comparison of

(*Continued on page 30*)

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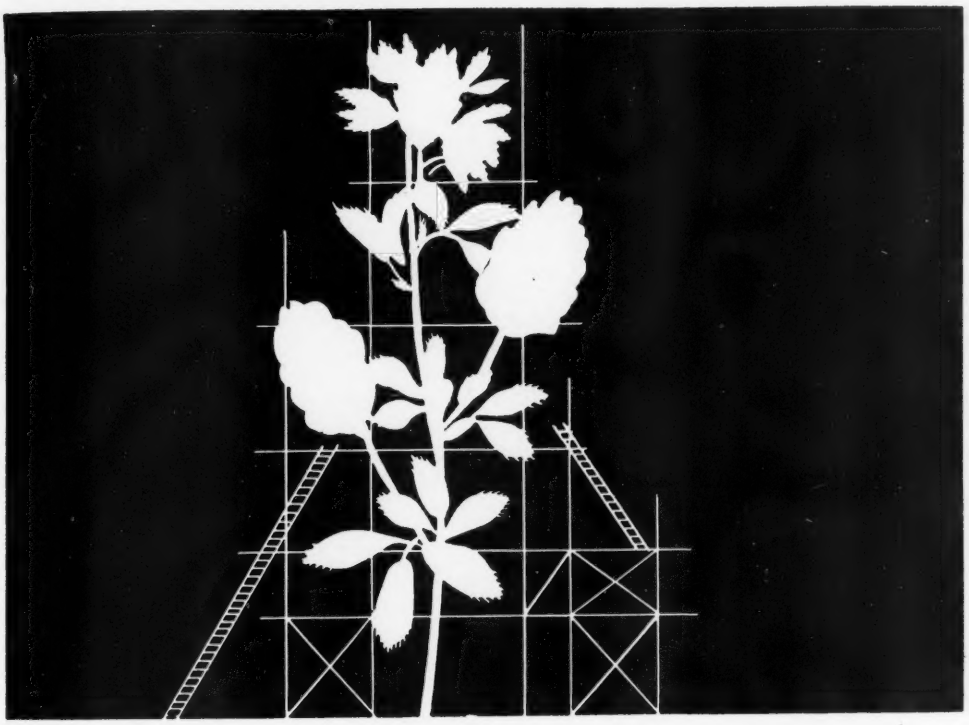

AMMONIA NITROGEN builds COVER CROPS

Grasses, clovers, and legumes—whatever the cover crop—ammonia nitrogen means rapid, early growth. By building vigorous cover, it helps hold the land down to earth, fights erosion, and cuts down the annual harvest of dust bowls.

High-nitrogen fertilizer, applied to cover crops, is an important part of the soil conservation program.

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Legume Pastures

(*Continued from page 28*)

various legumes in the amount of feed and the amount of beef produced per acre, according to Dean J. H. Longwell.

Other legumes and pounds of beef produced per acre at Lathrop were:

Wheat-Lespedeza—290 lbs.
Bluegrass sweet clover—236 lbs.
Bluegrass-Lespedeza—232 lbs.
Rye-sweet clover—230 lbs.
Bluegrass-Lespedeza (fertilized ammonium nitrate)—281 lbs.

At Sikeston, tall fescue and second-year sweet clover produced 353 pounds of beef cattle gain an acre, bromegrass and alfalfa 336 pounds, and winter oats and lespedeza 254 pounds. Wheat supplied little pasture because late harvesting of the preceding soybean crop delayed sowing until November 26, but the cattle gained 203 pounds an acre on the lespedeza after wheat had been pastured out. They also gained 145 pounds an acre on lespedeza in rye stubble.

At Columbia, the pasture value of different grass-legume mixtures grown on depleted soils limed and fertilized with phosphate and potash was determined. Beef cattle gained 265 pounds an acre on tall fescue and sweet clover, 252 pounds on redtop and lespedeza, 216 pounds on tall fescue and lespedeza, and 177 pounds on orchardgrass and lespedeza and on bromegrass and lespedeza.

Bluegrass under supplemented grazing returned 69 pounds more beef per acre than when under continuous grazing—258 pounds compared to 189 pounds.

Nitrogen for Oats

Within the past few years, more emphasis has been placed on mixed fertilizer containing nitrogen for oats. There are sound reasons for this. Varieties of oats we are growing today are much stiffer strawed than old varieties. They are also much more rust resistant. Nitrogen is not only much less likely to cause lodging, but resulting yield increases are much less likely to be limited by rust.

In the absence of rust and serious lodging oats respond well to comparatively heavy applications of nitrogen. Another favorable factor is that Clinton and Mohawk varieties being shorter strawed than old varieties are much less likely to smother the seeding. Heavy use of nitrogen does, though, seem to have an adverse effect on seedings made with the oats.

Not every farmer should use a mixed fertilizer containing nitrogen for oats, but many will find it profitable. It's hard to define just where the dividing line between the use of a moderate amount and little or none should be. Probably the amount of manure applied last year for corn or some other crop is one fairly good guide. If 15 to 20 tons of manure was applied, we would question the use of much nitrogen for oats. If no manure was applied, a fertilizer such as 10-10-10 is likely to be in order. If from eight to 12 tons were applied, fertilizer such as 6-12-6, 6-18-6, 4-12-8, and 5-10-10 would be a good choice.

Balanced Potato Diet

Sweet potatoes are famous for their refusal to respond to added plant food. The lack of response in many experiments may be because the nutrients were not supplied in correct proportions.

H. C. Hutson and J. C. Smith of the Texas Agricultural Experiment Station set up an experiment in which the fertilizer treatments included all possible combinations of rates which provided 0, 40, and 80 pounds per acre of nitrogen (N), phosphorus (P_2O_5), and potash (K_2O). The experiment will be conducted at Substation No. 11 for three to five years.

After summarizing the first year's results, Hutson and Smith report, "Yields from plots which received nitrogen alone at a rate of 80 pounds per acre were lower than those from plots which received no fertilizer. On the other hand, phosphoric acid and potash without nitrogen did not cause significant increases.

They further report, "The averages for main effects indicate that a combination of 40 pounds of nitrogen, 80 pounds of phosphoric acid and 80 pounds of potash per acre would probably be the best treatment in the test. This combination actually was the best and gave an increase of 147 bushels per acre above the plots which received no fertilizer, and practically all of this increase was in Grades 1 and 2. This combination produced 316 bushels per acre with good vines.

The above quantities of plant food are the equivalent of 800 pounds per acre of a 5-10-10 fertilizer grade.

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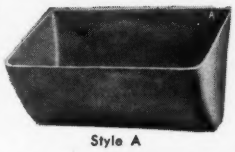
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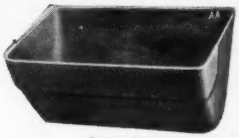
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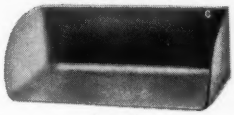
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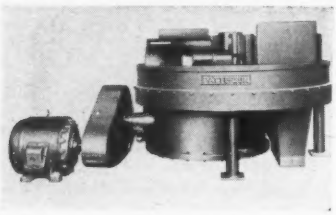
NEW EQUIPMENT

★ ★ ★

New Patterson Pan for Triple Super Mixing

The Patterson Foundry & Machine Company of East Liverpool, Ohio, has placed on the market a new type of plasticizing pan designed primarily for the phosphate fertilizer industry, but applicable to many types of reduction, refining and processing work. The pan is built in sizes up to ten feet.

As used in the manufacture of triple superphosphate, the crushed



rock is fed continuously to this machine which further reduces the material to finer mesh. The liquid materials are added continuously, and the pan, in addition to reducing the particle size of the rock, mixes the ground phosphate with the liquid ingredients, thoroughly plasticizing them and discharging the product through the bottom of the pan in form of wads suitable for drying. A belt conveyor carries the finished product from the pan to the dryer.

This new plasticizing pan is unique in that the mixing and plasticizing is by stages. The first stage is near the center of the pan where the material enters and, when thoroughly mixed, passes from one chamber to another where the plasticizing is completed. While designed primarily for the fertilizer industry, the pan is also well adapted to the ceramic, chemical and general process industries since it will handle practically any raw material in a dry, moist, or plastic state.

Link-Belt Motogear Drives Announced

Link-Belt Company announces that it has developed a new packaged power unit, called Link-Belt Motogear, consisting of a compact, enclosed helical gear drive with separate standard motor, flexibly coupled and mounted on one welded steel base plate.

A movable plate between motor feet and welded base plate provides for convenient adjustment, should shaft realignment be necessary for any reason.

Link-Belt Motogears are built in a variety of sizes, in double or triple reductions, and in a wide range of ratios and horsepowers. Input and output shafts are concentrically in line.

The Helical Gear Drive used on Motogears is like that employed in the corresponding Link-Belt Gearmotor but on the Motogear the motor is coupled to input shaft and mounted on a base plate instead of being integrally secured to side of drive.

The Helical Gear Drive is also available as a separate self-contained unit without the motor.

Complete information on Gearmotors, Motogears and separate Helical Gear Drives, 1 to 75 H.P., is given in a new 16-page Link-Belt Book No. 2247.

Barber-Greene Portable Conveyor

Bulletin 374 describes the complete range of the Barber-Greene Model 374 Heavy Duty Portable Conveyor. It lists fields of use and products handled. A series of sketches show applications in industry and construction. Accessories such as feeders, screens, hoppers, etc., are pictured and possible usage described. Construction features are illustrated and their operational advantages described. One page shows other material handling equipment manufactured by Barber-Greene Company. Copies available from Barber-Greene Company, Aurora, Illinois.

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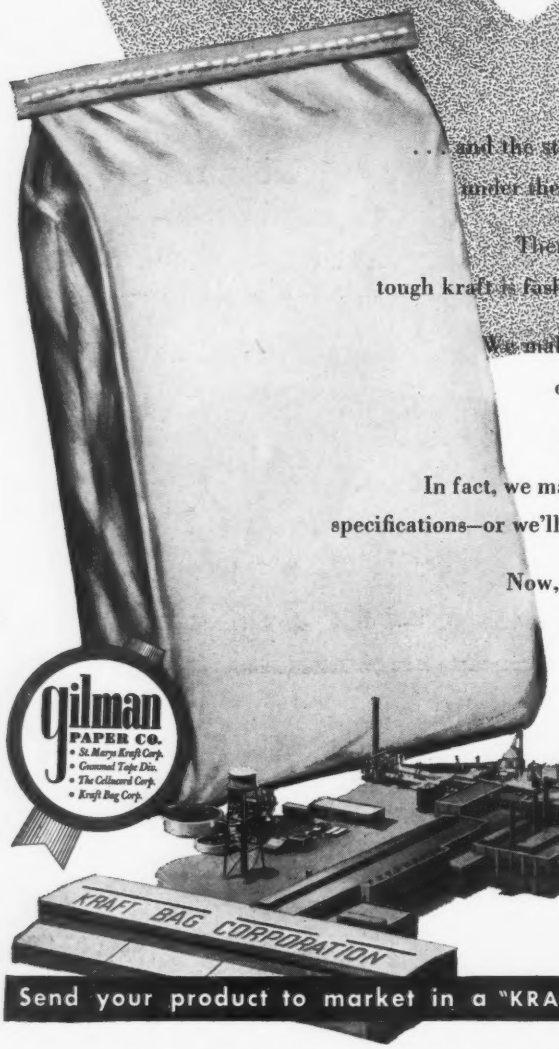

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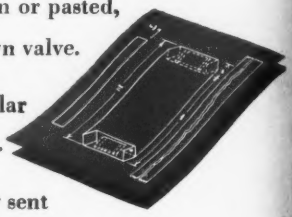

In fact, we make sacks to fit your own particular specifications—or we'll design them to fit special needs.

Now, more products are economically sent to market in the strongest KRAFT all-purpose multi-wall bags yet produced.

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